REMARKS

Reconsideration of the application in view of the following remarks is respectfully requested.

I. Status of the Claims

Claims 1-5 were previously pending.

Claims 1-5 are rejected.

No claims are amended.

Claims 1-5 are currently pending for examination.

II. Rejections under 35 U.S.C. § 103

A. Claims 1-3

1. The Examiner's Contentions

Claims 1-3 are rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 5,173.034 to Riffe ("Riffe") in view of International Patent Application Publication No. WO 90/53200 by Fogotti ("Fogotti"). With regard to Claim 1, the Examiner contends that the "hole in [valve plate] **33** leading from [discharge plenum] **41** to [second passage] **59**" of Riffe is a "valve." *See* Office Action, p. 2, last paragraph – p. 3, first paragraph. The Examiner contends that this hole establishes a "parallel arrangement of the discharge chambers." *Id.*, p. 3, first paragraph. The Examiner further contends that Figure 2A of Riffe shows that "the valve [i.e., the hole] may not exist," with the result of "establishing a serial arrangement of the discharge chambers (**63, 66, 68**)." *Id.* However, perhaps acknowledging that a "hole" is not a "valve," the Examiner admits that "Riffe does not teach the claimed valve limitations." *Id.* The Examiner then contends that Figures 2 and 3 of Fogotti disclose a:

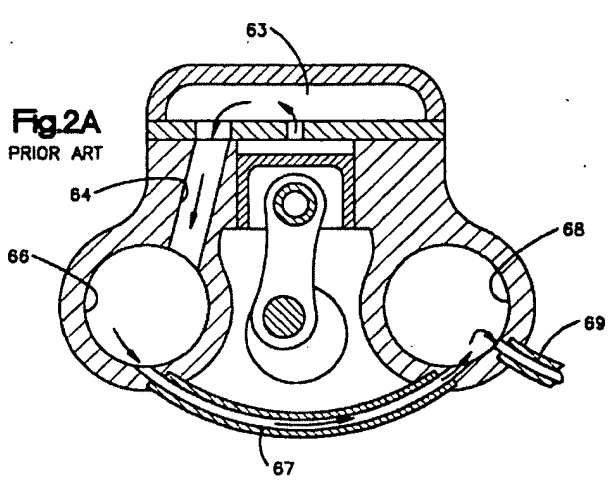
> valve **30** provided in the fluid communication between the first **12** and third **15** discharge chambers and which assumes an open position . . . when a gas mass flow . . . reaches a determined gas mass flow value, and a closed position blocking, at least in most part, said fluid communication between the first **12** and third **15** discharge chamber[s] when said gas mass flow reaches values that are lower than the determined gas mass flow value.

Id., p. 3, last paragraph – p. 4, first paragraph. Finally, the Examiner contends that it would have been obvious to one of ordinary skill in the art to modify the assembly of Riffe by implementing the valve of Fogotti between the first and third discharge chambers of Riffe, and that the resulting modified assembly discloses all of the limitations recited in Claim 1.

Applicant respectfully traverses the Examiner's rejections.

2. The Hole in Valve Plate **33** of Riffe Is Not a "Valve"

Applicant does not agree that the hole in the valve plate **33** of Riffe is a "valve," as that term is used in the claims of the instant application. Figures 2A and 2B of Riffe are reproduced below for the Examiner's convenience:



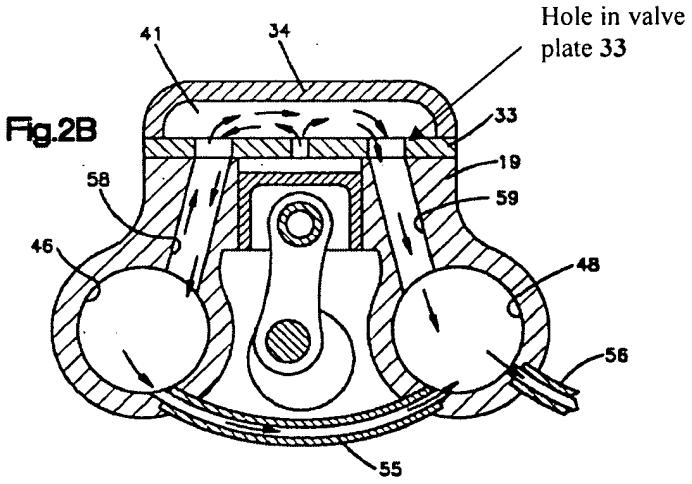


Figure 2B of Riffe depicts a **permanent second passage 59** between the discharge plenum **41** and the second muffler chamber **48**. *See* Riffe, col. 5, lines 34-38 ("[t]he present invention adds a second passage **59**"). As the Examiner has noted, gas passes from the discharge plenum **41** into the second passage **59** by way of a hole in the valve plate **33** (noted via arrow above). However, in the embodiment depicted in Figure 2B, this is a **permanent hole** – i.e., gas is always free to flow from the discharge plenum **41** into **both** the first passage **58** and the second passage **59**. Therefore, Figure 2B of Riffe depicts a **permanent parallel arrangement** of discharge chambers, wherein there are always **at least two fluid paths** for gas to follow upon exiting the discharge plenum **41**.

Id., col. 5, lines 34-38 ("The present invention adds a second passage **59** to the first passage **58** so that the **gases can pass simultaneously** from the discharge plenum **41** into **both** of the muffler chambers **46** and **48**") (emphasis added). Specifically, in the embodiment of Figure 2B, gas in the discharge plenum may flow either: (1) from discharge plenum **41** through first passage **58** into first chamber **46**, through transfer tube **55** into second chamber **48**, and out through discharge tube **56**; or (2) from discharge plenum **41** through second passage **59** into second chamber **48**, and out through discharge tube **56**. Therefore, Figure 2B of Riffe depicts a **permanent parallel arrangement** of muffler chambers, wherein there are always at least two fluid paths for gas exiting the discharge plenum to follow. *See, e.g., id.*, col. 3, lines 14-15 ("in parallel"); col. 6, line 11 ("parallel passages").

By contrast, Figure 2A of Riffe, which is marked as "Prior Art" in Riffe, depicts a **permanent serial arrangement** of chambers. *Id.*, col. 5, lines 32-34 ("the gases [in Fig. 2A] still had to pass in **serial sequence** through the muffler system") (emphasis added). That is, in Fig. 2A, there is only one fluid path for gases in the discharge plenum to follow – i.e., from the discharge plenum **63** through the passage **64** into the first chamber **66**, through the connecting tube **67** into the second chamber **68**, and out through the discharge tube **69**. As the Examiner has noted, the hole in the valve plate **33** that is present in Fig. 2B, which provides the interface between the discharge plenum **41** and the second passage **59** in Fig. 2B, is not present in Fig. 2A. The Examiner has neglected to mention, however, that the reason for the absence of this hole in Fig. 2A is that **there is no second passage** directly from the discharge plenum **63** into the second chamber **68** of Fig. 2A. As discussed, that is because Fig. 2A depicts a permanent serial arrangement of chambers, wherein there is only one fluid path for gas exiting the discharge plenum **63** to follow.

By contrast, Claim 1 of the instant application recites a "valve" provided in the fluid communication between the first discharge chamber (i.e., the discharge plenum **41** of Riffe) and the third discharge chamber (i.e., the second muffler chamber **48** of Riffe), which is capable of assuming both an open and a closed position. When the recited valve assumes an open position, there is a "direct fluid communication" between the first and third discharge chambers which, in conjunction with the recited "direct fluid communication" between the first and second discharge

chambers, establishes a "parallel arrangement of the discharge chambers." When the recited valve assumes a closed position, the "direct fluid communication" between the first and third discharge chambers is "block[ed], at least in most part," which establishes a "serial arrangement of the discharge chambers." Clearly, then, the recited valve is a **mechanism** or **apparatus** that is capable of **switching between open and closed positions**. The term valve is used in this manner consistently throughout the specification of the instant application. *See, e.g.,* Applicant's U.S. Patent Application Publication No. 2007/0201990 ("Publication"), ¶ 31 ("valve means **22** which assumes an open position [when gas flow is high] . . . and a closed position [when gas flow is low]"), ¶¶ 32-34 (describing various mechanisms that can be used for the valve, including a "blade valve" and a "suction valve") and ¶ 37 (describing how the valve can be constructed to have a "negative pre-tension force" that tends to force the valve back into the closed position). A contemporaneous dictionary definition confirms that the term "valve" refers to a device or mechanism that regulates flow, and not merely a "hole:"

> valve (n) **2.** a mechanical device by which the flow of liquid, gas, or loose material in bulk may be started, stopped, or regulated by a movable part.

Webster's New Explorer College Dictionary, 2007 edition, at 1099 (Merriam-Webster 2007).

In view of the foregoing, the hole in valve plate **33** depicted in Fig. 2B of Riffe, and the absence thereof in Fig. 2A of Riffe, is not a "valve" as that term is used in the claims of the instant application. The intrinsic and extrinsic evidence is clear in that the valve must be a **device** that is capable of switching between open and closed positions, thereby switching the assembly between parallel and serial arrangements, respectively. A hole, or the absence of a hole, is not a "device" that is capable of switching between open and closed positions, and nothing else in Riffe discloses such a device. Therefore, Riffe does not disclose, teach or suggest the recited valve.

3. The Valve **30** of Fogotti Does Not Change The Assembly of Fogotti Between a Serial and Parallel Arrangement of Discharge Chambers

The Examiner contends that Fogotti discloses a valve **30** which is "provided in the fluid communication between the first **12** and third **15** discharge chambers," which "assumes an open position, communicating the first and third discharge chambers" when the gas flow is high, and

which assumes a "closed position blocking at least in most part, said fluid communication between the first **12** and third **15** discharge chambers" when the gas flow is low. *See* Office Action, p. 3, last paragraph – p. 4, first paragraph. Critically, however, the Examiner does **not** contend that the valve **30** of Fogotti changes the arrangement of chambers in Fogotti between a serial and parallel arrangement. The Examiner could not so contend because, in fact, the valve **30** of Fogotti does **not** perform this function. Instead, the valve **30** of Fogotti merely regulates the flow rate in the **static serial arrangement** of chambers in Fogotti. Figures 2 and 3 of Fogotti are reproduced below for the Examiner's convenience:

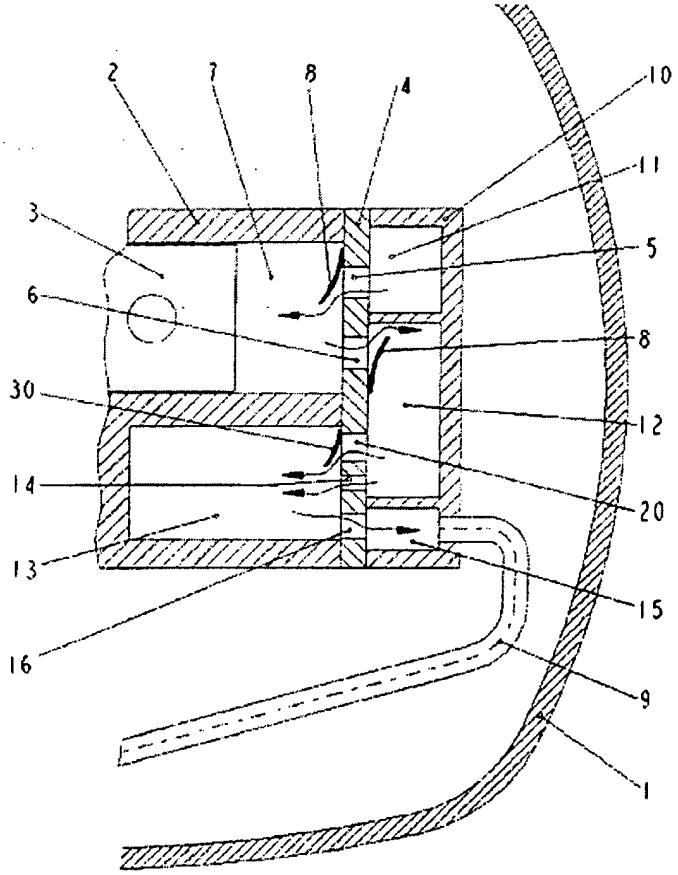


FIG.2

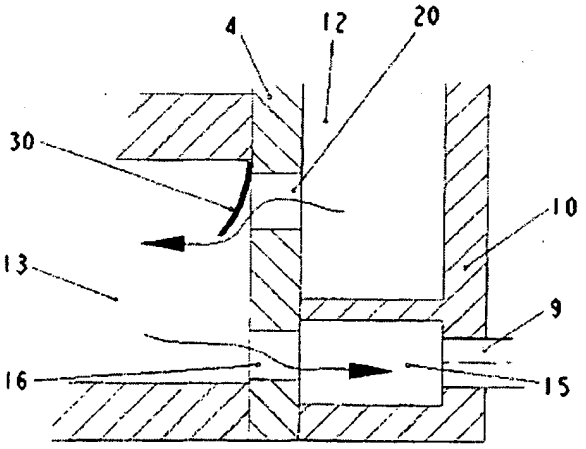


FIG.3

Figure 2 of Fogotti depicts a **permanent serial arrangement** of discharge chambers. That is, there is only one fluid path for gas from the first discharge chamber **12** to follow in route to the discharge tube **9** – i.e., from the first discharge chamber **12** into the second discharge chamber **13**, then into the discharge subchamber **15**, and finally out through the discharge tube **9**. *See* Fogotti, p. 7, lines 14-31. Figure 2 depicts that there are two gas passages **14** and **20** between the first discharge chamber **12** and the second discharge chamber **13**. Critically, however, both of these gas passages provide fluid communication between the **same two discharge chambers** – i.e., the first **12** and second **13** discharge chambers. Thus, regardless of whether a particular mass of gas exits the first discharge chamber **12** via the first gas passage **14** or the second gas passage **20**, it still travels to the same place – i.e., the second discharge chamber **13**. Accordingly, Fig. 2 of Fogotti depicts a **permanent serial arrangement** of discharge chambers wherein gas must always flow from the first discharge chamber **12** directly into the second discharge chamber **13**.

Fig. 2 of Fogotti also depicts a valve **30** disposed in the second gas passage **20**. Even assuming *arguendo* that this valve **30** assumes an open position in situations of high gas flow, and a closed position in situations of low gas flow, this valve **30** still does not switch the assembly of Fogotti from a serial to a parallel arrangement of chambers, as required by the claims of the instant application. If the valve **30** is fully closed, then gas from the first discharge chamber **12** must flow through the first gas passage **14** into the second discharge chamber **13**. If the valve **30** is fully or partially open, then gas may flow from the first discharge chamber **12** into the second discharge chamber **13** via either the first gas passage **14** or the second gas passage **20**. Critically, however, in either case, gas from the first discharge chamber **12** may **only** flow directly into the second discharge chamber **13**. There is no other "chamber" into which gas from the first discharge chamber **12** may flow. Thus, regardless of whether the valve **30** is open or closed, Fogotti merely discloses a **permanent serial arrangement** of chambers wherein gas may only flow through the chambers in one specific sequence.

Figure 3 of Fogotti similarly discloses a permanent serial arrangement of chambers. In Figure 3, there is only one gas passage **20** between the first discharge chamber **12** and the second discharge chamber **13**. *See* Fogotti, p. 7, lines 32-35. In this embodiment, the valve **30** regulates

the flow rate between the first and second discharge chambers by varying its cross-sectional area. *Id.*, p. 8, lines 3-6 ("the dimensional variation of the cross-section of the [valve] . . . being obtained as a function of the mass flow between the first and second discharge chambers **12**, **13**"). Accordingly, this embodiment also merely discloses a permanent serial arrangement of chambers, wherein gas from the first discharge chamber **12** must always flow directly into the second discharge chamber **13**.

In view of the foregoing, Fogotti does not disclose, teach or suggest a valve that switches a discharge chamber assembly between a serial and parallel arrangement of chambers. In fact, Fogotti teaches away from such a valve because Fogotti merely discloses a **permanent serial arrangement** of discharge chambers.

4. Combining Riffe with Fogotti Would Not Result in the Claimed Discharge System

As discussed in Sections II.A.2-3 *supra*, neither Riffe nor Fogotti discloses, teaches or suggests the use of a flow-rate-sensitive valve that automatically switches a discharge chamber assembly between a serial and parallel arrangement in response to changes in the gas flow rate. Riffe separately discloses a permanent serial arrangement (Fig. 2A), and a permanent parallel arrangement (Fig. 2B), but does not disclose an assembly that is capable of switching between parallel and serial arrangements in response to changes in flow rate. In fact, Riffe does not disclose the use of a valve at all, because a hole is not a valve. Furthermore, Fogotti merely discloses a permanent serial arrangement – Fogotti does not address the possibility of a parallel arrangement at all, and certainly does not disclose an assembly that is capable of switching between serial and parallel arrangements in response to changes in the flow rate. Therefore, any combination of Riffe and Fogotti would not yield the claimed valve.

5. Claims 1-3 Are Not Obvious Over Riffe and Fogotti

In view of the foregoing, neither Riffe nor Fogotti discloses, teaches or suggests the recited valve, which switches a discharge chamber assembly between serial and parallel arrangements in response to changes in the flow rate, and it would not have been obvious to one of ordinary skill in

the art at the time of invention to modify Riffe and/or Fogotti to yield such a valve. Furthermore, the claimed valve provides significant advantages over the prior art, including Riffe and Fogotti.

One advantage of the claimed valve is that it provides a series arrangement of discharge chambers when the fluid flow rate is low, and a parallel arrangement of discharge chambers when the fluid flow rate is high. A series arrangement is desirable at low fluid flow rate because, in such a situation, relatively little power is needed to drive the fluid through the system. Therefore, it is advantageous to have a long flow path so as to increase noise dampening. A series arrangement provides such a long flow path (see Publication, ¶ 36). Furthermore, a parallel arrangement is advantageous at high fluid flow rate because, in such a situation, a relatively large amount of power is needed to drive the fluid through the system. Therefore, it is advantageous to allow at least a part of the fluid to follow a shorter flow path (i.e. the path flowing from the first discharge chamber directly into the third discharge chamber) so as to decrease the power required. A parallel arrangement allows at least part of the fluid to follow a shorter flow path, which decreases the power needed to drive the fluid through the system (see Publication, ¶¶ 35-36).

The claimed discharge system operates optimally with respect to noise dampening and power usage at both low and high fluid flow rate because it automatically switches between a parallel arrangement and a series arrangement in response to changes in the flow rate. This automatic switching is accomplished by the claimed valve. Neither Riffe nor Fagotti discloses, teaches, or suggests the use of such a valve or the benefits that are achieved with such a valve. Therefore, Claim 1 is not obvious over the cited combination of Riffe and Fagotti, and this claim is in condition for allowance. Withdrawal of the rejection of this claim is respectfully requested.

Claims 2 and 3 depend from independent base Claim 1. Therefore, these claims are in condition for allowance due at least to their dependence on an allowable independent base claim. Withdrawal of the rejections of these claims is respectfully requested.

B. Claims 4-5

Claims 4-5 are rejected under 35 U.S.C. § 103(a) as being obvious over Riffe in view of Fogotti and further in view of U.S. Patent Application Publication No. 2002/0136646 to Seo et al. ("Seo"). The Examiner has cited Seo solely for its alleged disclosure of the additional "valve blade"

limitations recited in Claims 4-5. Without addressing the validity of the Examiner's position that Seo discloses the recited "valve blade" limitations, Seo clearly does not disclose the use of a valve that switches a discharge chamber assembly between series and parallel arrangements in response to changes in the fluid flow rate. Claims 4-5 both depend from independent case Claim 1, which recites such a valve. Therefore, for at least the reasons discussed above with respect to Claim 1, Claims 4-5 are not obvious over the cited combination of Riffe, Fogotti and Seo. Withdrawal of the rejections of these claims is respectfully requested.

III. Conclusion

Each and every point raised in the Non-Final Office Action dated July 24, 2009 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that Claims 1-5 are in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: November 24, 2009

Respectfully submitted,

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